Standard Practice for Radon Mitigation Systems in Existing Low-Rise Residential Buildings

#### Abstract

In June 2002 EPA proposed to incorporate by reference, ASTMI E2121, into its voluntary National radon program. EPA has decided to incorporate E 2121 by reference and retain EPA's Radon Mitigation Standards for a limited time. This discussion provides EPA's radon stakeholders with the context for EPA's original proposal and final decision. EPA solicited and considered the many comments provided by the states, radon industry, proficiency organizations, and others in reaching a final decision. This paper provides a summary and response to the principal comments received by EPA. This decision is consistent with the National Technology Transfer and Advancement Act (NTTAA) of 1995, and by the Office of Management and Budget (OMB) Circular A-119 on Federal participation in the development and use of voluntary consensus standards. This document and other materials related to this policy decision can be found on EPA's web site at www.epa.gov/iaq/.

#### Discussion

This discussion contains seven elements: (a) the policy decision, including the policy itself; (b) a comment summary and response; (c) a brief summary of comments specific to E2121; (d) policy implementation; (e) model state language; (f) original policy proposal text; and, (g) contact information.

**A.** <u>Decision and Policy</u>. EPA has incorporated ASTMI E2121 by reference into its voluntary radon program as originally proposed. EPA will also retain its *Radon Mitigation Standards* (RMS) in effect through March 2006. See the *Policy* (12-March-2003) and comment summary for further detail.

U.S. Environmental Protection Agency
Office of Air and Radiation, Office of Radiation and Indoor Air
Indoor Environments Division

POLICY 12 March 2003

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The Agency finds that the ASTMI standard practice, E 2121, provides an improved measure of public health protection over EPA's existing Radon Mitigation Standards<sup>2</sup>. EPA prefers E 2121, and highly recommends the use of E 2121 to any party requiring the use of a radon mitigation standard. EPA's recognition of E 2121 is valid for the current ASTMI certification period ending in March 2006.

Therefore, EPA is incorporating E 2121 by reference into its National voluntary radon program<sup>3</sup>. Furthermore, EPA will retain the existing edition of the *Radon Mitigation Standards* through the period ending March 2006. This provides state and local governments, the radon industry, training providers and others with time to accommodate this policy. Should it at any time become necessary, EPA will update and reissue its *Radon Mitigation Standards*.

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EPA will reconsider this policy if ASTMI effects a material change to E 2121 prior to March 2006. This policy is consistent with Office of Management and Budget (OMB) Circular A-119, the National Technology Transfer Advancement Act (NTTAA), and Agency precedents incorporating voluntary consensus standards by reference.

**B.** Comment Summary. In response to a request for comments on the proposed policy, EPA received two broad categories of comments. The first pertained to the proposed policy, and the second to the E2121 standard itself. EPA is not addressing comments specific to the E2121 standard for two reasons. First, EPA could only consider this policy after ASTMI published the standard as final, making further comment on E2121 moot at this time. Second, it would be inappropriate and unlawful for EPA to attempt to unduly control a private organization's standard setting process. The EPA representative to the E2121 committee was only one of many who comprised the work group/committee.

With regard to the proposed policy to incorporate E2121 by reference into EPA's voluntary radon program, the Agency received comments from 10 state radon programs (California, Colorado, Delaware, Iowa, Massachusetts, Michigan, Minnesota, New Jersey, New York, and Pennsylvania), and from the E25 Committee of the Conference of (State) Radiation Control Program Directors (CRCPD). Other organizations submitting comments included the American Association of Radon Scientists and Technologists (AARST), the Southern Regional Radon Training Center (SRRTC), the National Radon Safety Board (NRSB), and the National Environmental Health Association (NEHA). EPA also received a handful of comments from individuals in or associated with the radon industry. The following discussion summarizes the major concerns (as represented by the number of comments) and EPA's response to the comments submitted by reviewers.

1. Access to Copies of E2121. Many who commented raised the issue of the public, industry and states having difficulty obtaining copies due to the \$35 per copy cost set by ASTMI. A minority did not think the copy cost was an issue.

**Response**. As with its other radon publications, EPA will make single copies of E2121 available to any

requester though the IAQ-Information hotline. EPA has arranged with ASTMI to acquire the right to print and distribute copies of ASTMI E2121. Also, with EPA's retention of the RMS, concerns regarding the cost of E2121 copies should be reduced further.

2. Impact on State Radon Programs. Most states supported the proposed policy or saw no significant impact on the state radon program. Two comments supported using the best available technical

<sup>&</sup>lt;sup>1</sup> ASTM International (ASTMI), E 2121, January 10, 2001 (as amended).

<sup>&</sup>lt;sup>2</sup> EPA 402-R-93-078, Revised April 1994

<sup>&</sup>lt;sup>3</sup> Activities authorized by Title III, *Indoor Radon Abatement*, TSCA, 1988, and by Title IV, *Radon Gas and Indoor Air Quality Research*, SARA, 1986, and other miscellaneous statutory provisions.

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document, i.e., ASTMI E2121. One comment cautioned about the impact the policy would have on states that reference the RMS.

Similarly, several comments pointed out that adoption of E2121 would result in mitigation systems being inconsistent (presumably in design and installation) between 'regulated' and 'un-regulated' or 'non-regulated' states; with the non-regulatory states being most affected.

**Response**. As those who commented pointed out, there is a clear divide between states that 'regulate' mitigation (and testing) activities and those that do not. Currently only a handful of states require mitigation contractors to install mitigation systems to conform with a recognized mitigation standard (i.e., the EPA RMS) or an 'equivalent' standard (e.g., ASTMI E2121). Several states within this group have quite rigorous requirements in this regard and enforcement provisions to back them up, or have developed their own mitigation standard, e.g., in New Jersey, Pennsylvania and Illinois. These "regulatory" differences among these (regulatory) states also results in variations in the quality and effectiveness of mitigation systems, albeit generally acceptable differences. Many of the "non-regulatory" states simply treat the RMS as the recommended or standard of choice.

The issue of variation among installed residential mitigation systems is a function of several key factors, including but not limited to: (1) a regulatory or mandatory environment; (2) the degree of inspection and enforcement in a regulatory environment; (3) the absence of either (1) or (2), especially significant in non-regulatory states; (4) the economics of competition, especially in non-regulatory states; and, (5) the quality and suitability of builder installed passive radon-resistant techniques in new homes. This is especially true when viewed against the backdrop of the Federal voluntary approach that provides guidance and information to consumers, states and radon services providers and practitioners. For these reasons, differences among mitigation installations have always existed and will continue as long as the degree of regulation, inspection and enforcement varies significantly among the states, as it currently does. By preserving the RMS in effect until 2006, the states should have time to make any changes to their radon programs necessitated by EPA's E2121 policy.

Also, some of those commenting suggested that the lack of support for E2121 by radon practitioners in non-regulatory states would lead to variations in mitigation installations, and also invite potential liability (presumably on the part of mitigation system installers).

**Response**. Variations in installed mitigations will continue to exist as long as the unevenness among state radon programs exists (as described above). The degree of variation will only become less significant as state "regulation" of those who install mitigation systems becomes either more uniform or commonplace. Liability is always of concern to self-employed persons, companies and organizations and is a risk associated with doing business in a litigious society. In this case, it is reasonable to presume that liability concerns would move mitigation system installers in the direction of using a standard, rather than away from it, thus helping to minimize variations in systems.

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3. Making E2121 equivalent to the RMS. Several comments suggested making E2121 equivalent to the RMS. Other comments suggested keeping E2121 and RMS and that EPA update the RMS.

**Response**. As the policy states, EPA will retain the existing RMS until at least 2006. The policy does make the RMS and E2121 equivalent for EPA's intents and purposes, and for those of the states given their comments. EPA decided to retain the RMS for two primary reasons. First, because so many of those who commented requested it, especially those in the radon services industry. Second, expending scarce EPA resources to update the RMS was judged contrary to the intent of OMB Circular A-119, given E2121's existence. In this regard, it is important to remember that the NTTAA and A-119, which directs its implementation in the Federal Government, prefers the use of a standard like E2121 in lieu of creating (or updating) a Federal (EPA) standard.

4. Not a significant difference between RMS and E2121. Two of those who commented did not see a significant difference between E2121 and EPA's RMS.

**Response**. EPA agrees completely. After a thorough comparison, EPA concluded that E2121 was at least equivalent to the RMS, and included several improvements. For more information and details on the differences between the RMS and E2121, please see *Comparison of Two Standards for Radon Mitigation in Existing Low-Rise Residential Buildings: ASTM's E2121 and EPA's RMS*, by Philip H. Anthes, October 2002.

<u>5. (Adopting the policy) Fails to unify/coordinate the radon community</u>. Two of those who commented asserted that EPA's adoption of the proposed policy would contribute to divisions within the radon industry, and complicate industry efforts to develop a greater degree of unity, particularly with regard to standards.

**Response**. EPA is sympathetic to the myriad of issues and challenges facing the radon industry in the current marketplace. EPA applauds the industry's efforts to promote radon risk reduction with consumers and others in a position to influence consumer decision-making regarding radon, e.g., residential real estate professionals. EPA also supports the industry's efforts to develop standards, especially those that are necessary to fill existing gaps representing a demonstrated need, e.g., residential testing for radon in drinking water from private wells. EPA understands that many in the radon industry were unaware, and consequently did not participate in, ASTMI's decade long effort to complete E2121.

EPA encourages anyone with an interest in radon to participate in the ASTMI standards development process, including the current E1465 effort to develop a radon-resistant new construction standard. Participation should also include efforts by other standards setting organizations, e.g., the AARST standards consortium, and ASHRAE, among others. Those industry members who do participate in standards setting activities such as these, are encouraged to communicate the substance of their activities as broadly as possible, e.g., through industry newsletters and lists-serves. EPA will continue its efforts to inform industry and others through our usual communications channels, including

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our website ( <a href="www.epa.gov.iaq/">www.epa.gov.iaq/</a> ), in speeches and public appearances by managers and staff, and in meetings involving our stakeholders.

However, in the final analysis, EPA remained obligated under the law and Executive Branch direction (i.e., OMB A-119) to consider this action. In addition to the general support for taking this action, EPA found no compelling reason for not taking this action. Also, EPA's decision to retain the RMS until 2006 significantly ameliorates commenter concerns about E2121 being the only standard available, due to EPA's original proposal to retire the RMS in favor of E2121.

- **C.** <u>Comments Specific to E-2121 (Relative to the RMS)</u>. EPA is unable to directly address the following comments, as discussed in Section B. of this paper. In complying with A-119, EPA could only consider the final ASTMI E2121 standard of practice. However, in the interest of facilitating future and similar discussions, EPA is including a brief summary of the comments we did receive in this category.
- 1. E2121 cannot stand alone as a replacement for the RMS.
- 2. There are serious omissions of policy, e.g., existing radon system (RMS upgrade recommendation, post mitigation retest, minimum 4" pipe, distance to chimney flues, mani-folding, back-draft test, fan election, exterior plugged cords).
- 3. Venue. ASTMI is a questionable/inappropriate venue for developing/maintaining consensus-based radon standards etc., poor timeliness, little radon industry participation, lack of radon engineering among members, etc.).
- 4. E2121 needs an addenda; there's no provision for sealing vis reduced system effectiveness/energy penalties.
- 5. There was inadequate industry participation in E2121.
- 6. There is no back-drafting standard.
- **D. Policy Implementation**. EPA's decision to incorporate E 2121 will be accomplished through the following actions.
- 1. EPA has adopted a policy on E2121 (Final, 20 March 2003).
- 2. Information on E2121 will be included, as appropriate, in revisions to existing or in new documents, e.g., the *Consumers Guide to Radon Reduction*, thereby educating consumers and radon mitigation contractors about E2121.
- 3. EPA will encourage the states, radon industry, training providers and others, to use E2121 and treat
- E2121 as equivalent to the RMS. Also, with regard to EPA's decision, the Agency has prepared model language suitable for use by states and others (see Section E. below).
- 4. As appropriate, EPA will revise its programmatic documents to reflect this policy, e.g., by including E2121 in EPA's State Indoor Radon Grant (SIRG) guidance to the states.
- 5. EPA will communicate this decision to other Federal Departments and Agencies (particularly those with housing programs), and other interested parties, e.g., members of the Federal Interagency Committee on Indoor Air Quality (CIAQ).

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- 6. EPA has informed the Interagency Committee on Standards Policy (ICSP) via the EPA Standards Executive for A-119. EPA's decision will be included in the ICSP's *Annual Report on Federal Agency Use of Voluntary Consensus Standards*.
- **E.** <u>Model State Language</u>. EPA recommends the following language on ASTMI E2121 to states and local governments when formulating policy, developing criteria for radon services registration, licensing and regulatory programs, or in drafting provisions of statutory law or amendments, etc.
- "Providers of radon in air mitigation services shall install residential radon mitigation systems to meet (or exceed) existing consensus standards, i.e., the ASTM International (ASTMI) *Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings*, E2121 (as amended), or the U.S. EPA's *Radon Mitigation Standards* (EPA 402-R-93-078)(as amended), or any equivalent consensus standard that is determined to be technically competent, results in an equal or greater level of risk reduction, and is applicable to low-rise residential buildings."
- **F.** <u>Contact Information</u>. Please more information, contact Philip Jalbert (202.564.9431, <u>jalbert.philip@epa.gov</u>) or Gene Fisher (202.564.9418, <u>fisher.eugene@epa.gov</u>). This and other radon information can be found on the web at <u>www.epa.gov/iag/radon</u>.
- **G.** <u>Obtaining Copies of E2121</u>. The Agency is making single copies of E2121 available free of charge to anyone requesting one. To order, please contact Ms. Diane Hamilton (202.564.9427 or via email <u>hamilton.diane@epa.gov</u>), and provide your name, mailing address, phone number and email.
- **H.** <u>Original Discussion of the Proposed Policy</u> (June 2002). For completeness, EPA is here including the language of the original discussion paper on the proposed policy.

The Environmental Protection Agency's (EPA) current National radon policy is based upon two types of documents. The first group is a corpus of scientific and technical (base) documents, e.g., the *Technical Support Document for the Citizen's Guide to Radon*, or the *Radon Mitigation Standards*. This group includes guidance, protocols, and voluntary standards (of practice), among others. The second group is consumer documents, e.g., including the *Consumer's Guide to Radon Reduction*, *A Citizen's Guide to Radon*, and the *Home Buyer's and Seller's Guide to Radon*; these three are the most important consumer publications. The creation of all these documents required extensive research and analysis, stakeholder involvement, rigorous scientific review, several years and significant human and capital resources to compile. Together, these documents are the basis for all EPA guidance to the American public on radon.

As author of the (above) documents, EPA is responsible for their maintenance, revision, printing or retirement. Since base documents and consumer documents are closely related, a new base document must be reviewed for its potential to affect related documents, and ultimately, the Agency's radon policy. A review decision may also be triggered by the development of a private sector document. Therefore, EPA may conduct a document or policy review whenever circumstances warrant.

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On January 10, 2001, ASTM International (ASTMI) issued its *Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings*, E2121-01. This voluntary consensus standard culminates more than a decade of effort on the part of many, including EPA. As a consequence of E2121, EPA decided that an internal review of its *Radon Mitigation Standards* (EPA 402-R-93-078, Revised April 1994) was warranted. EPA has concluded that relative to the *Radon Mitigation Standards*, the E2121 standard: (1) will achieve the same or a higher level of risk reduction; (2) is equal or better in terms of its technical competence; and, (3) is the best available consensus-based standard applicable to low-rise residential buildings.

Therefore, EPA proposes to incorporate E2121 by reference. This means that EPA will defer to E2121 as the preferred mitigation standard, and will place its *Radon Mitigation Standards* on the list of inactive documents. EPA will also incorporate E2121 in several other ways.

- 1st -- EPA will adopt a policy on E2121 (Draft, 20 June 2002).
- 2<sup>nd</sup> -- Consumers will be educated to ask that mitigation systems be installed to the E2121 standard.
- 3<sup>rd</sup> -- Third, the preference for E2121 will be reflected in revisions to existing or in any new consumer oriented publications, and on EPA's radon web site, as appropriate.
- 4th -- Fourth, EPA will encourage the radon industry, training providers and others, to adopt E2121.
- 5<sup>th</sup> -- Fifth, as appropriate, EPA will encourage the states to prefer or adopt E2121.
- 6<sup>th</sup> -- Sixth, EPA will revise selected other documents to reflect this change, e.g., by including E2121 in EPA's State Indoor Radon Grant (SIRG) guidance to the states.
- 7<sup>th</sup> -- Seventh, EPA will broadly communicate this policy decision to interested Federal and other parties, e.g., the Interagency Committee on Standards Policy (ICSP), and U.S. Army Corps of Engineers.
- 8<sup>th</sup> -- Eighth, EPA will submit this decision for inclusion in the ICSP's *Annual Report on Federal Agency Use of Voluntary Consensus Standards*.

Although this is the first instance of the EPA radon program incorporating a private sector standard by reference, there is a substantial precedent for incorporating E2121 by reference. There are hundreds of examples of EPA (and other Federal agencies) incorporating the standards of private standards setting organizations like ASTMI and ASHRAE by reference. These actions are consistent with the National Technology Transfer and Advancement Act (NTTAA) of 1995, and its predecessors, the Federal Technology Transfer Act of 1986 and the Stevenson-Wydler Technology Innovation Act of 1980. The NTTAA encourages agencies to use voluntary consensus standards in lieu of government-unique standards developed by an Agency. It is also consistent with the Office of Management and Budget (OMB) Circular A-119, which directs Federal participation in the development and use of standards developed or adopted by voluntary consensus standards bodies.

As a radon stakeholder, EPA is interested in your perspective on and opinion of our proposal to incorporate by reference, E2121. EPA is interested in your opinion because the principle of good government requires it, and broad stakeholder involvement is important and necessary. Among other things, EPA hopes to identify any potential unintended consequences of this action, and address them

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prior to making this policy change. EPA is particularly interested in how this change might affect the states, since several specifically cite EPA documents and publications in their radon related legislation, regulations or policies. The state operated radon offices and programs, and the radon services industry, are critical to the continuing success of the Nation's radon risk reduction efforts.

This Discussion Paper is one of three written items; please consider them all in preparing your written comments; the other two are the draft Policy (20 June 2002), and a covering letter. Separate cover letters were prepared for: (1) EPA's Regional offices; (2) the Conference of Radiation Control Program Directors (CRCPD): and, (3) radon industry organizations, i.e., the American Association of Radon Scientists and Technologists (AARST), the National Environmental Health Association (NEHA) National Radon Proficiency Program (NRPP), the National Radon Safety Board (NRSB); and, (4) the four Regional Radon Training Centers (RRTC).

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